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INFECTIOUS DISEASES

Prevalence of hepatitis and HIV infections and vaccination rates in patients entering the heroin-assisted treatment in Switzerland between 1994 and 2002

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Abstract. *Background*: Hepatitis C virus (HCV) remains very prevalent in injection drug users (IDUs). In spite of recommended vaccinations against hepatitis A virus (HAV) and hepatitis B virus (HBV), many IDUs remain susceptible to HAV and HBV. *Study population and methods*: Patients entering heroin-assisted treatment between 2000 and 2002 (N = 210) were compared for infectious disease status with patients entering this treatment in 1998 (N = 243) and between 1994 and 1996 (N = 1035). Infection status was determined with the aid of questionnaires and blood tests for antibodies against HAV, HBV core antigen, HCV and HIV. *Results*: In the cohort 2000–2002 78.3% of the patients were HCV positive, 53.3% were HBV positive, 41.2% were HAV positive and 12.6% were HIV positive. In comparison to the cohorts entering the heroin-assisted treatment at an earlier time, there was a significant reduction of HBV and HAV infections, but not of HCV and HIV infections. 15.6% of the patients entering between 2000 and 2002 were vaccinated against HBV and 10.3% against HAV. 31.1% of patients at entrance were susceptible for HBV and 48.5% for HAV. In comparison to patients entering treatment in 1998 there was no significant increase in patients who were vaccinated against HBV. *Conclusions*: This data illustrates the need for improving HCV prevention and more consequent vaccination against HBV and HAV in IDUs.

Key words: Hepatitis virus, Heroin-assisted treatment, Human immunodeficiency virus (HIV), Injection drug use, Vaccination

Abbreviations anti-HAV = antibodies against HAV; anti-HBc = antibodies against HBV core antigen; anti-HBs = antibodies against HBV surface antigen; anti-HCV = antibodies against HCV; anti-HIV = antibodies against HIV; HAT = heroin- assisted treatment; HAV = hepatitis A virus; HBV = hepatitis B virus; HCV = hepatitis C virus; HIV = human immunodeficiency virus; IDU = injection drug user

Introduction

Injection drug use carries a high risk of aquiring parenterally transmitted viruses like HBV, HCV and HIV. HCV is transmitted especially frequently through injection drug use due to its high rate of chronicity, high prevalence among IDUs and relatively high viremia. After the introduction of anti-HCV screening of blood donors, injection drug use is the main transmission route of HCV in countries like USA, Australia, Germany and Switzerland [1–4]. In Western Europe, the prevalence of HCV in IDU populations is between 40 and almost 100% [5–14]. The prevalence of HBV infections among IDU populations in Western European countries is between 20 and 70% [7–14]. For HAV infections among IDUs, studies from Switzerland, Germany, Canada and USA report a prevalence of about 30% and higher [10, 15–17]. Only a fraction of IDUs who are susceptible to HBV are vaccinated against this virus [11, 18–20]. In Switzerland the combined HAV/HBV vaccination is recommended for IDUs [21, 22]. The prevalence of HIV infections among IDUs in countries of the European Union is in general stable or decreasing [23]. In Switzerland, Germany, Great Britain and Sweden, regional or national studies of the middle and late 1990s in different settings show HIV prevalences in IDUs between 1 and 15% [7–14].

Heroin-assisted treatment (HAT) started in Switzerland in 1994. After a pilot phase, which ended in 1996, the treatment programme was continued and is now part of the regular treatment system in Switzerland. The treatment is provided by special treatment centers. Currently, there are 23 of these

centers in the German and French speaking parts of Switzerland. Criteria for admission to the HAT are a heroin addiction (ICD-10 definition) of at least 2 years, an age of at least 18 years, at least two previous treatment attempts and physical, psychological or social deficiencies. When there are major deficiencies of these types, an admission without previous treatment attempts is possible. Due to the continuous monitoring system of HAT (data at the entry, during and at the end of the treatment) it is possible to monitor the prevalence of hepatitis virus and HIV infections in a group of IDUs and thereby get indicators of possible effectiveness of preventive measures for reducing these viruses in IDUs.

Study population and method

The sample consisted of IDUs who entered the HAT for the first time between November 2000 and June 2002. 104 readmissions and 69 patients who changed the treatment center during this time period where not included in the sample. Incomplete data (none or only one of two obligatory questionnaires) was another exclusion criteria. This was the case for 166 out of the 376 newly admitted patients. Missing entrance forms are mainly due to individual work load of staff in the treatment centers and apparently does not correlate with patient characteristics. Using *t*-test, respectively χ^2-test, age and sex of the 166 patients with missing entrance forms did not differ significantly to the 210 patients with complete entrance forms. The results of this sample (N = 210) were compared with previous results on persons who entered this treatment in 1998 (N = 243) and between 1994 and 1996 (N = 1035). The questionnaires were routinely answered at the beginning of the treatment, completed by the staff of the treatment centers and sent in anonymous form to the Research Institute for Public Health and Addiction in Zurich. Serum samples were tested at entry in 54% (HCV), 56% (HBV, HIV) and 61% (HAV) of the test results, depending on the data already available. Treatment centers do not test patients at entry if they were tested within 6 months before entering the HAT, and no exposure, e.g. sharing of needles, was identified within this time period. The following infection markers were assayed: anti-HAV for a HAV (if vaccination was not reported), anti-HBc for HBV; anti-HCV and/or a positive HCV-PCR test for HCV and anti-HIV for HIV. The presence of anti-HBs without anti-HBc was considered as a marker for a previous successful vaccination against HBV. In virtually all patients (>97%) injection drug consumption could be confirmed for the period before entering HAT. The prevalence ratios in the three admission cohorts were statistically compared by χ^2-tests (with Yates correction and df = 1), using a level of significance of $p < 0.05$.

Results

The population of the recent study (entrance between the years 2000 and 2002) consists mostly of men (82.4%), the average age was 33.7 years (range 21–50 years) (see Table 1). More than half of the patients consumed heroin for more than 10 years, the average time was 11.6 years (range 2–27 years). The median of onset of injection drug use was at an age of 19 years. All patients were in drug dependence treatment before admission to the HAT and most of them were in a methadone maintenance treatment programme at least once. About half of the patients participated previously in drug dependence treatment programmes more than seven times.

Prevalence of hepatitis virus and HIV infections

The results of the current in comparison to previous studies is shown in Table 1. The prevalence of HCV was 78.3% (137 of 175 test results). Compared to patients who entered HAT at an earlier time, there was no significant change.

For HBV, a significant decrease was found in the cohort of 2000–2002 (53.3%, 89 of 167 tested patients) compared to admissions in 1998 and to admissions between 1994 and 1996. The prevalence of anti-HAV without previous vaccination in the cohort 2000–2002 was 41.2% (56 of 136 test results). For the cohort 1998 no results for HAV were available. In 1994–1996 the prevalence was 70%. This number may include a small number of vaccinated persons, but this is most likely not the reason for the highly significant decrease from 1994 to 2002, because vaccination against HAV was not often done at that time.

The prevalence of HIV in admissions between 2000 and 2002 was 12.6% (21 of 167 test results). The percentage of HIV positive patients has not changed significantly compared to patients who entered treatment in 1998 and to persons who entered between 1994 and 1996.

Vaccination against hepatitis A and B

Among the patients entering HAT between 2000 and 2002 only 15.6% (26 of 167 test results) were successfully vaccinated against HBV. Thus, the percentage of HBV vaccinated patients has not changed significantly since 1998 ($\chi^2 = 2.8$), when 8% (10 of 121) were vaccinated against HBV at admission. The percentage of patients who were vaccinated against HAV was 10.3% (14 of 136). For 1998 and for 1994–1996 the vaccination status was not recorded.

Fortynine patients of 167 (31.1%) were anti-HBc and anti-HBs negative and thus susceptible for an HBV infection. For 36 of these patients (73.5%) an HBV vaccination was planned during the treatment. Eleven patients (22.4%) refused to be vaccinated, and

Table 1. Prevalence of hepatitis virus and HIV infections

	(1) Admissions 2000–2002 (N = 210) This study	(2) Admissions 1998 (N = 243) Blättler et al. (2000)	(3) Admissions 1994–1996 (N = 1035) Steffen et al. (2001)	χ^2-tests: A (1) versus (2) B (1) versus (3)
Sex				
Female	17.6% (37)	35% (136)	30% (310)	
Male	82.4% (173)	65% (249)	70% (725)	
Age				
Average age	33.7	32	30.8	
Hepatitis C virus				
Positive	78.3% (137)	76% (137)	82% (706)	A $\chi^2 = 0.1$ n.s. B $\chi^2 = 1.2$ n.s.
Missing values	35	63	176	
Hepatitis B virus				
Positive	53.3% (89)	68% (112)	73.2% (625)	A $\chi^2 = 7.2$ $p < 0.01$ B $\chi^2 = 25.3$ $p < 0.001$
Missing values	43	79	181	
Hepatitis A virus		Not available		
Positive	41.2% (56)		70% (592)	B $\chi^2 = 27.1$ $p < 0.001$
Positive, vaccinated	10.3% (14)		Not available	
Missing values	74		190	
HIV				
Positive	12.6% (21)	14% (33)	15.3% (138)	A $\chi^2 = 0.09$ n.s. B $\chi^2 = 0.07$ n.s.
Missing values	43	10	136	

n.s. = not significant.

for 2 persons (4.1%) an unspecified medical contraindication was declared. Concerning HAV, 57 out of 136 patients (48.5%) were susceptible to this infection. For 34 persons (59.6%), an HAV vaccination was planned during HAT, 18 persons (31.6%) refused such an vaccination, and for 5 persons (8.8%) an unspecified medical contraindication was declared.

Discussion

As confirmed by this study, HCV infection remains the most prevalent serious virus infection in IDUs, and no decrease within 8 years could be shown. The prevalences of HBV and HAV have moderately, but significantly decreased, but were still high at 53.3%, and 41.2% respectively. HAV [24–27] and HBV infections are transmitted easily in the viremic phase, but since HAV never and HBV (in immune competent adults) only rarely becomes chronic (in about 5–10% of infections), the chance of acquiring the infection by occasional sharing of injection devices is not so high as with HCV. The number of HAV infections could not be determined reliably, however. Anti-HAV could have been indicative of an unreported vaccination since during different medical procedures and vaccinations, the HAV vaccination may have not been recognized by the patient. Recently notification of IDU related HAV infections to the Public Health Office of Switzerland is requested to achieve a better appraisal of the epidemiological situation [28]. Besides insufficient injection hygiene, the life style of IDUs and contamination of the drugs may be a reason for the high prevalence of HAV and HBV. The decrease in HAV and HBV infections is presumably linked to less sharing of injection devices and more hygienic environments of IDUs in the last 10 years.

The HIV prevalence of 12–15% in this study is 30–38 times higher than in the general Swiss adult population [29] and no significant decrease was observed. IDUs on methadone maintenance treatment in Switzerland had 6.4% prevalence [9] and 5% of the patients who entered an abstinence orientated therapy in Switzerland in 2004, reported a positive HIV test [30]. In England and Wales, a HIV prevalence in IDUs of only 0.9% was found at the end of the 1990s [31].

The majority of patients was still susceptible to HBV or HAV although in Switzerland the combined

HAV/HBV vaccination of IDUs is recommended. This is particularly disappointing because all of the patients were in drug treatment at least once before HAT and most even several times. The mean age of IDUs studied increased over time, probably indicating that IDUs in Switzerland are an aging population. In this the case, the number of susceptibles for HAV- and HBV infections will decrease independently of vaccination. Nevertheless, it needs to be discussed why the recommendation to vaccinate IDUs is not implemented widely and how higher vaccination rates could be achieved.

Even more concern is raised by the unaltered high prevalence of HCV. It is essential that newly-starting IDUs are reached as early as possible, because sharing of syringes seems to be common in the beginning of injection drug use [19, 32]. Syringe or needle sharing is especially risky with older IDUs, since these persons are very often infected [6, 33, 34].

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